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(19)(CA) **APPLICATION FOR CANADIAN PATENT** (12)

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(54) Wear Rod for Snowmobile Ski and Similar Vehicles

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(71) Same as inventor

(57) 4 Claims

ABSTRACT 2108537

A wear rod for steering skis for snowmobiles and similar vehicles. The wear rod in cross section is comprised of a horizontally oriented component and a vertically oriented rectangular component. The horizontally oriented component is to be of sufficient length to protect the ski from excessive wear. The vertically oriented portion is to be of sufficient length, width and height to provide the desired steering ability. The position of the vertically oriented component can be varied to achieve optimum steering stability and behaviour characteristics. This wear rod provides the designer with a much greater range of adjustment of steering behaviour.

A WEAR ROD FOR SNOWMOBILE SKI AND SIMILAR VEHICLES

Background Of The Invention

The invention is directed to improvements in wear rod design to better control the steering behaviour of snowmobiles and similar vehciles. Prior art provides very little design range to change steering effort or control. Traditional wear rod design consists of a round rod performing two functions - turning and wear protection of the ski base.

The steering bais in this system is uncontrollable. The length of wear rod in front of the turning centre of the ski is greater than that which is behind. This allows self energizing behavior or wander.

The only way a traditional wear rod can increase its turning ability is to go longer to the rear or larger diameter. The lengthening far from the turning centre makes extreme additions to turning effort because of the leverage. If a larger rod is used then steering effort again increases as does self energizing problems.

One attempt marketed today uses a separate flat carrier with an added round conventional rod in a shortened form. This has the obvious problem of inadequate turning ability. It is also difficult in this system to provide different options of round rod length with existing bolt patterns.

All round rods have problems of penetration into hard snow with wear because the contact width increases. It then requires more weight to penetrate properly. Snowmobiles are very sensitive to this problem.

Summary Of The Invention

This invention conprises improved wear rods for snowmobiles. They consist of cross sectional y rectangular components to separate the protective and steering functions of the wear rods to enhance their abilities. The horizontal component of the rod allows the protection of the ski base without creating any steering ability and bias problems. It allows the adaptation to any bolt pattern for mounting to the ski. It also provides improved strength to resist laterial bending with much better mechanical advantage and that strength is much less effected by wear. The horizontal component also allows the mounting bolts and vertical component to be offset for ease of access to mount bolts and better structural support from the ski for the vertical component.

The vertical rectangular component of the rod allows the contact width of the rod to remain the same with wear. This provides consistent penetration without having to adjust ski bearing pressure. The height and length selections for the vertical component can be chosen based on rider preferences and demand. The position of the vertical component front and rear can be controlled to achieve desired bias relationship.

Traditional skis have steering engagement surfaces incorporated into their bases, These longitudinal keels are unadjustable and create bias problems for designers. Because the mount bolt or load application point for the ski must be to the rear to the ski centre, this keel creates self energizing steering behaviour. A wear rod of the present invention needs no such keel.

Greater steering control by the wear rod and not the keel allows for a much wider range of adaptability with simple wear rod change.

Wear resistant carbide inserts are of critical importance to control wear rates on hard surfaces with this design.

Description Of The Drawing

Fig. 1 Shows a traditional ski and wear rod configuration

Fig. 2 Cross section at A-A of fig. 1

Fig. 3 A new type ski of our design with invented wear rod design shown.

Fig. 4. A cross section of fig. 3 at B-B with left ski and right ski views.

Fig. 5 A traditional wear rod cross section with carbide wear insert

Fig. 6. Cross section of the invention

Fig. 7. Cross section of the invention in offset forms making left and right wear rods.

Fig. 8. A traditional ski and wear rod cross section collapse above wear rod.

Description Of The Preferred Embodiment

Figure 1 Shows a traditional ski and wear rod. Dotted line C represents the turning centre of the ski with a common caster angle. Point b is the point of contact from which bias in measured. b_f is the front of the wear rod and b_r is the rear length of the wear rod. Note that b_f can change depending on snow conditions and ski flotation depth but it invariably changes for the worse. In order for a ski to behave properly B_f should be shorter than b_r which they are not. This creates wander and dangerous self energizing behavior.

Figure 2 Is a cross section of figure 1 at A-A. Note the ski mount bolt location in figure 1 which must be to the rear of centre to have the ski perform properly by floating up in the snow. This requirement is a major problem with figure 2 type cross sections.

Figure 3 Is a ski designed by the inventor with the invented wear rod design. Note the flat horizontal component extends to the front to the ski without imparting any turning ability or bias problems. It serves as a protective surface. Note also the favourable bias relationship of b_f to b_r.

Figure 4 Is a view of the system in figure 3 in cross section a B-B. This figure shows the cross section of a pair of skis in their normal orientation as seen from the rear. The wear rod mount bolts are readily accessible along the inner edge of the ski and the vertical wear rod component is well supported by the vertical structure on the top side of the ski. This is an important feature to prevent collapse of the ski base upwardly when hard impact forces are encountered.

Figure 5 Is a conventional wear rod.

Figure 6 Shows one form of the invention in cross section with top mount bolt, horizontal rectangular component and vertical rectangular component.

Figure 7 Cross section shows another form of the invention where the mount bolts and vertical components are offset to allow better bolt access and better support of the vertical component.

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Figure 8 Shows a conventional cross section of ski and wear rod showing ski keel collapse over wear rod due to impact with hard objects such as rocks. This drastically reduces the wear rods function.

Claims

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A wear rod for snowmobiles and similar vehicles consisting in cross section of a horizontally oriented component and a vertically oriented component.

2. A bolt on wear rod according to claim 1 with a horizonital rectangular component of sufficient legth and thickness to protect the base of the ski and a vertical rectangular component of variable legth, height and width to impart the desired steering characteristics.

3. A wear rod according to claim 2 where cross sectional dimensions of said components to be idcally: horizontial 1/8" x 1 x 28 inches and vertical 1/4" x 3/4 x 22" with 2 in of rear bias but not limited to those DIMENSIONS

4. A wear rod according to claim 2 with cross sectional horizontial and vertical components with offset orientation to create left and right wear rods to further enhance strength relationships with upper strength structures on the ski. The mount bolts may also be offset to facilitate their access.

Fig 1

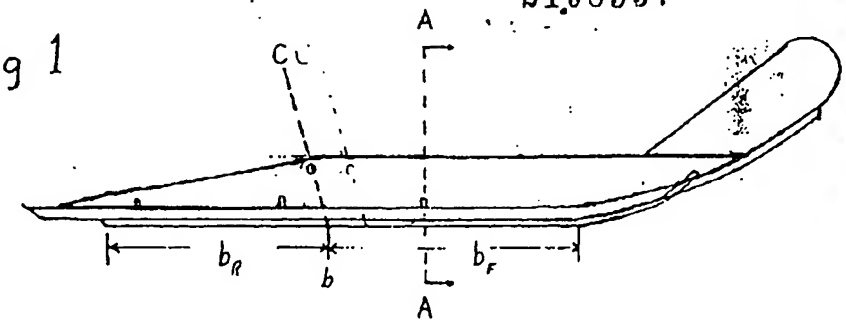

Fig 2

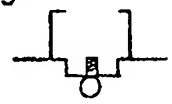

Fig 3

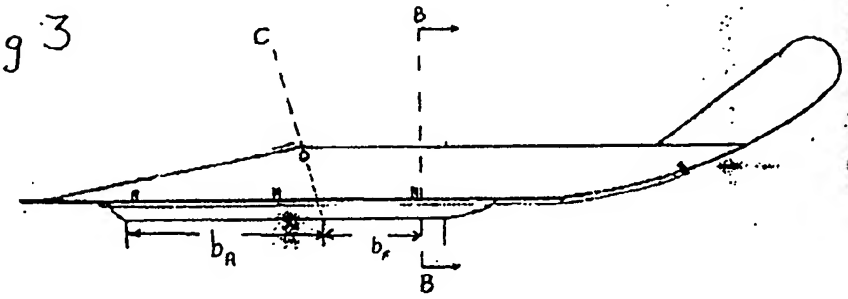

Fig 4

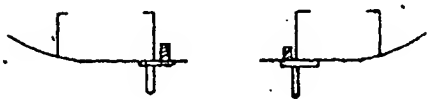

Fig 5

Fig 6

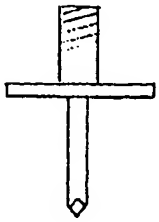

Fig 7

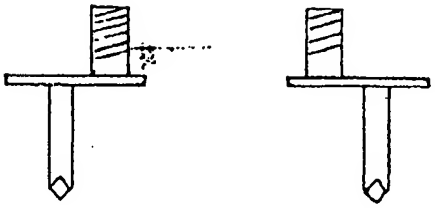

Fig 8